



Earth Science

DECEMBER 1961
45c

ROCKBOUNDS NATIONAL MAGAZINE

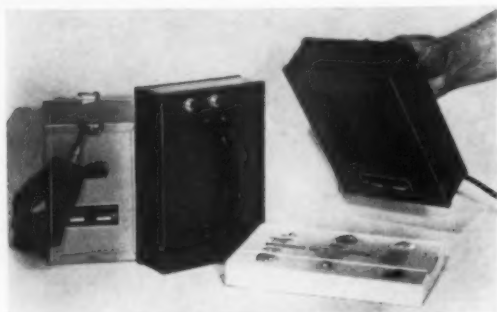


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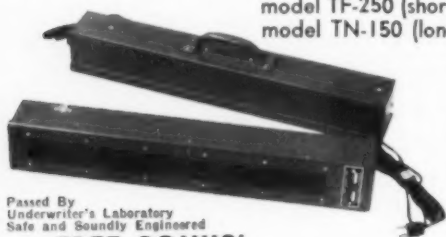


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Earth Science

Rockhound's NATIONAL Magazine
Official Publication of the Midwest Federation of Mineralogical Societies.

Volume 14
No. 6
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Cover Winter Detail

Brother Rabbit left his tracks in fresh-fallen snow beside a lone thistle on Pine Hill Fur Farm, Du Page County, Illinois, home of William Vokoun, the photographer. Mr. Vokoun has won a number of awards for his work, particularly in the field of animal photography. His most recent was second prize in the 15th International Photo Zoo Contest.

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It is not essential that one belong to a club in order to be eligible to join the Midwest Federation.

You will be very welcome and you will find the advantages to be gained far exceed the slight cost and effort expended.

The Midwest now comprises more than 100 clubs and many individuals, and is a branch of the larger American Federation which comprises the regional Federations of the U. S. and Canada.

For further details, contact Mrs. Bernice Rexin, 3934 N. Sherman Blvd., Milwaukee 16, Wis.

EARTH SCIENCE, *Official Magazine*

P.O. BOX 1357, CHICAGO 90, ILLINOIS

Editor's Memo Pad



SNOW IS A MINERAL!

Concerning the picture on our current front cover, some might inquire why a snow scene picture on an Earth Science magazine. Well, SNOW is a mineral by every standard of reckoning. By definition a mineral is a substance, usually solid, of definite chemical composition and of natural origin.

Of all minerals none is more beautiful than snow, none more important, and few are more plentiful. Consider the hundreds of thousands of cubic miles of snow on the wastes of Antarctica and elsewhere throughout the world. Besides, for our Christmas issue what could be more appropriate or attractive? More on the subject of snow later.

(For another snow picture see our December, 1958 cover).

TO KEEP HISTORY STRAIGHT

In the October issue of Earth Science we reported that a meteorite had fallen in the yard of Troy Peterson of Marshall, Texas. We have since learned that this was just a pure unadulterated hoax, perpetrated by some one who should have known better, and what was said to have been a meteorite was just a piece of ordinary petrified wood.

This all goes to prove that there is some truth in the old saying, "You can't believe more than 25% of what you see, nor more than half of what you read in the newspapers."

We are now concerned about what we shall learn about the reported Bloomington, Illinois fall also mentioned in our October issue. Keep your fingers crossed. If we find we are wrong, we shall be the first to admit it.

CROWN OF THE ANDES

In this issue will be found a splendid description and history of the world famous Crown of the Andes, written by Dr. J. Daniel Willems. This is, perhaps without question, the most beautiful and valuable work of gem art ever produced in all history.

We are able to announce at this time that this famous Crown along with its accessory counterparts will be displayed at the Midwest-American Show in Des Moines next July. This, then, will be the opportunity of a lifetime for all Midwesterners to view and study this work of art, and even now they should begin to make plans for their visit to the show enabling them to take advantage of this rare privilege.

EARTH SCIENCE NOW ON MICROFILM

Over the years libraries and individual research workers accumulate mounting volumes of scientific data. The process of microfilming has proved a great boon to those whose storage space is not limitless. Nearly all libraries, public and private, now have microfilm readers by which the miniature film can be read as easily as the original printed page of which it is a reproduction.

We are pleased to announce that all issues of EARTH SCIENCE from Volume I, No. 1 to date have now been microfilmed. Sale of the film will be handled by University Microfilms, Inc., 313 N. First Street, Ann Arbor, Michigan. All inquiries should be directed to University Microfilms, Inc.

"Midwest-American"
DES MOINES
July 26-31, 1962

Rip Rap

Keeping You Up To Date

IN DEFENSE of the oft-repeated charge that the science of engineering has no spiritual motivation, Clement Freund, the University of Detroit's Dean of Engineering and Architecture, recently wrote: "I have read in Genesis that the Lord told Adam to subdue the earth. . . . Is it not reasonable to suppose that to utilize the materials and control the forces of nature is precisely what the Lord meant by 'subdue'?" These forces are gigantic. The Weather Bureau, for example, calculates that the energy equivalent of winds blowing over the entire world at any one time is equal to about seven million nuclear bombs.

That our over-burdened teachers are threatened by a new menace is noted by John Shaffer of the State University of New York at Cortland. We quote in part from his letter to *The Science Teacher*: ". . . Gregarious and articulate rockhounds may actually invade the nation's schools before teachers are ready for them. Once a classroom becomes invaded, a teacher is forced to play the tragic role of a silent onlooker as the rockhound coyly reveals his diamond, or fossil, or petrified snail to a captive audience. Children often catch the rockhound fever and revel in the joys of self-instruction and freedom from the pedagogical strait jacket. Or, worse yet, they may turn on their teacher and terrify her with such questions as 'What makes emeralds green?' 'Why are quartz crystals hexagonal?' or 'How can you tell the age of this fossil?'"

Some years ago a farmer in New Brunswick, Canada decided that black muck from a nearby peat swamp would enrich his cucumber patch. The cucumbers died—from an excess of copper in the peat. Too little may be as bad as too much. Copper is generally well distributed throughout most U.S. soils but a report to the Micronutrient Symposium of the American Chemical Society indicates that in forty-one states the soil is deficient in boron. The deficiency occurs mostly in humid regions. Soils deficient in iron, on the other hand, tend to occur in arid parts of the country. Twenty-nine states report a deficiency of zinc; corn and fruit trees suffer most from a shortage of zinc in the soil.

Chip Chat

Something to Think About

ROCKHOUNDS ARE SHARP. Men have been cracking heads and rocks since the first primordial man found that a flint rock was harder than his fist and, with brutish craft, fitted a sharp-edged flake of it to a shaft.

Evidence of man's continued interest in rocks is plentiful. For instance, Sir Walter Scott, in *St. Ronan's Well*, said, "And some rin up hill and down dale, knapping the chucy stanes to pieces wi' hammers like see many road makers run daft. They say it is to see how the world was made."

From another old English book, long out of print, we find: "Stones are curious things; if a man is paid for breaking them, he is wretched; but if he can bring his mind to do it gratis, he is at the summit of contest. With these men life is a felicitious dream; they are not subject to low spirits like other men; they smile away their human day; and when they see fit to die, they don't seem to mind so very much. Can they make anything easy by giving it one of their hard names? Is the grave to them a cretaceous, or argillaceous, or ferruginous bed? I beg pardon, stratum! No, it is because their hobby has been breaking stones while egotists have been breaking human hearts."

Going back to the first primordial man, the same tool doubtless served alike to break skulls and coconuts, or to hack at the limbs of trees and of men. Thus this man distinguished himself from all lower creatures and, with a stone, founded the beginning of the arts by which man not only defends and maintains himself but holds rule over the world in which he lives. In a limited way animals were using tools before the advent of man; for example, the bull was goring with his horns, the beaver carpentering with his teeth, apes were throwing rocks at intruders, orangutans defended themselves by pelting possible enemies with thorny fruit, and the chimpanzee cracked nuts with a small rock held in his hand. But the implements devised by man were adapted by art in ways that beasts have no notion of.

Primitive man got both his exercise and his meat at the same time. In the process, he was also sharpening his wits as he studied not only the habits of his

quarry but his entire environment. Thus he noted that rocks were not all alike; that some were hard, others relatively soft; some were brittle and others were tough. The use of tools and weapons expanded his environment and his mind grew with his expanded field of operations.

Similarly today rockhounds are unwittingly improving the functioning of their minds thru the hobby. The one who studies minerals becomes a keen observer; field trips sharpen the senses of sight, hearing, taste and smell. Keen, alert senses are the mark of a good thinker; dull senses the complement of dull thinkers.

Rockhounds are sharp, man, sharp!

Domer L. Howard

Courtesy: Rock Lore, St. Louis

Something New Again

As a new heading for one of our editorial columns we first considered Chit-chat, a good old Webster word, but on referring to our dictionary we found it defined as "familiar or trifling conversation; small talk,"—perhaps even gossip.

Such nonsense being farthest from our mind we next came up with Chip Chat, which more nearly reflects our objectives, Chips being small parts of a whole, and Chat to speak lightly in an easy manner, to chatter, and "so mote it be."

AMERICAN GEOLOGICAL INSTITUTE'S Visual Education Committee is revising its *Directory of Films of Possible Interest to Geologists*. The new edition is expected to contain descriptions and evaluations of more than 500 films. The results of a recent film survey conducted by the committee indicate that the most popular geological films are:

In the Beginning, *Socony*

Fossil Story, *Shell*

Geological Work of Ice, *Encyclopaedia Britannica*

Ground Water, *Encyclopaedia Britannica*

Kilauea Eruption of 1955, *United States Geological Survey*

Mountain Building, *Encyclopaedia Britannica*

The Bahamas, *Humble*

Wearing Away of the Land, *Encyclopaedia Britannica*

The society's pamphlet, S-3 Films for Earth Science Courses, may be obtained by sending ten cents to Publications, American Geological Institute, 2101 Constitution Ave., N.W., Washington 25, D. C.

Our Authors

Father Luke McMillian served as Program Chairman of the Midwest Federation and as Vice President of the Central Michigan Lapidary and Mineral Society while stationed at Lansing. From his present post of Assistant Pastor of St. Stephen Church in Milwaukee he has given us some excellent ideas on "How to Display Minerals."

The nucleus of Father McMillian's notable collection was formed from the minerals of his native state of New Mexico. Among his outstanding specimens are two pieces of sylvite, a rare form of halite, in which columns of cubes are stacked on top of each other to a height of six inches or more; Mexican bladed calcite weighing approximately forty pounds; and a specimen of wulfenite with blades up to six inches long.

Alvin Ericson of Chicago is an electrical engineer who took up gem cutting after observing cutters at work in Bryce Canyon National Park in Utah about ten years ago. He is a member of the Chicago Lapidary Club and recently was awarded a trophy for best gem faceting at the 11th annual handcrafted gem and jewelry competition at the Chicago Natural History Museum. The first of three parts of Mr. Ericson's article "Faceting is Easy" appears in this issue.

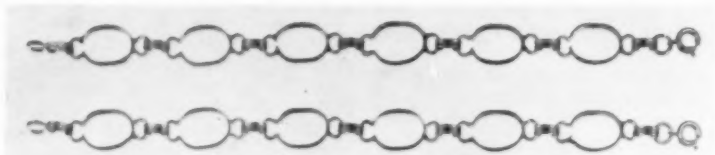
INDIANAPOLIS ROCKRAMA

The Indiana Geology and Gem Society Rockrama held in the Agricultural Building at the Indiana State Fairgrounds in Indianapolis, October 6, 7, and 8th, was a fine success and all those concerned with it in any way are to be congratulated. The exhibits were excellent, the attendance was good, and the dealers present displayed materials for sale of unusual quality.

The Directors' Meeting of the Midwest Federation held in connection, presided over by Leo Yanasak, was well attended and the current reports and projected plans of the Federation received attention. President Yanasak stated that the Des Moines Club was going all out in their preparation for the great Midwest-American Show and Convention to be held in Des Moines next July which promises to be one of the biggest and the best ever held.

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The Crown of the Andes

The Fascinating Story of an American Crown

By J. DANIEL WILLEMS

THE year was 1590, A.D., and the place was Popayan, a "very noble and loyal" city in Peru, South America. It was a flourishing community noted among other things for the beauty of its churches; their collections of statues, sculpture, damask, tapestries, and many other works of art. It was one of the leading cities in South America and the King of Spain had bestowed upon the city a coat-of-arms all its own. His Holiness Pope Paul III had made it a bishop's see and religious fervor ran high.

Then there came rumors of a great plague. Travelers and Indian runners from distant places brought dire news that the whole country was being swept by an epidemic of alarming proportions. Human beings, great and low, died like so many flies. The inhabitants became terrified; even more so when earthquakes became more frequent, and threatening rumblings were heard in Mount Purace, the great volcano nearby.

Delegations of frightened citizens waited upon the venerable bishop and asked his advice. He wisely told them to stay where they were, and began a novena, which is a series of prayers, to the Blessed Mother of the Savior, asking her to intercede with her Divine Son and avert the catastrophe with which they were threatened. And Popayan escaped the plague which devastated the rest of the territory. As time went on and more than a year went by without any sign of the plague, the fear vanished from the hearts of the people and they lifted up their hearts in greater religious zeal than ever before.

Among the oldest settlers in Popayan were the descendants of families which had come after the conquest of Peru from Spain. Many of these belonged to the Spanish nobility and had become immensely rich in the New World. Here they had found a paradise and proceeded to build a permanent settlement. They had founded



CROWN OF THE ANDES

A work of art unsurpassed anywhere on the earth.

great plantations, and in a beautiful valley high up on the slope of the central range of the Andes they erected a city. This valley is today, as it was then, a land of milk and honey. Life was sweet for the Spanish immigrants and they had built the city beautiful: Popayan.

After the danger of the threatened plague was over the principal families of the city joined together in a plan to create a very special and rich distinction in honor of the Blessed Virgin to whom they gave full credit for saving their city and their families from the scourge of the epidemic. They decided to make a lavish crown for her statue which holds a place of honor in every Catholic church, and there were ten in Popayan. The whole population donated gold, and many pounds were collected. A group of noblemen formed a committee which directed the design and creation of the diadem. Then they gave carte blanche to the goldsmiths, and no restrictions except:

"The crown must exceed in beauty, in grandeur and in value the crown of any monarch on Earth, else it would not be a becoming gift to the Queen of Heaven."

Work on the crown was begun in 1593 and it required more than six years to finish. The design was so intricate that it challenges belief, and the workmanship so delicate that modern goldsmiths look at it with amazement. It was made in a day when time was no consideration. The hands were patient, and the cause was holy and inspiring. The most gifted goldsmiths were engaged to make the crown and leading artists and designers from Spain were in consultation as the work proceeded.

As the planning progressed the fervor mounted and gold was not enough to offer, there must be gemstones. The world famed "Gem of the Andes," the emerald, had been mined by the Incas and collected for generations by the wealthy patrician families

of Popayan. Emeralds, no less, it should be! In quality more beautiful than those with which Cleopatra adorned herself; larger and more lavish than those mined in the Ural Mountains for the Russian Court. No other gemstones were to be considered and only the most valuable of the famed gems of local origin were to be used. An all-emerald crown of such beauty that no other crown in existence could equal it.

Then the treasure chests of the wealthy were opened and in a most glorious gesture there poured forth hoarded emeralds in immense numbers, of fabulous value, and matchless beauty. From that hoard 453 of the best stones were selected, the finest to be had in the New World. Expert lapidaries were brought from Spain to shape and polish these jewels to enhance their beauty and prepare them for mounting. Carefully they were graded and arranged in the diadem in balanced sequence and proportions to make this an object of near perfection and outstanding beauty. The size and shape of the crown were carefully calculated for proper fit to the head of the statue of the Blessed Virgin, which was somewhat less in height than life size. When it was finished and placed upon the head of

the venerable statue it was a good fit in size, proportions and beauty; a perfect symbol of the adoration of the people for their benefactress. The artists glowed in ecstasy over their accomplishment and religious fervor suffused the people to greater heights. The crown was then officially named, "The Crown of our Lady of the Andes" and a great festival with gorgeous pageantry was planned to express the gratitude of the population to the Blessed Virgin for delivering them from the great plague.

The ceremonies of the crowning of the statue took place in 1599, on December 8, on the day of the Feast of the Immaculate Conception in the cathedral of Popayan. The crown was attached to a cushion of velvet and this was placed upon a white horse panoplied in velvet for parading through the streets to the palace of the Archbishop by a military guard of honor. There it was viewed and inspected by the nobility of Popayan and their friends, many of them from neighboring cities and faroff places. Later, when the light of day waned and the darkness began to settle down the most impressive spectacle in the ceremonies took place. The population of the city and its visitors lined the streets on the route from the Arch-



bishop's palace to the cathedral, each holding a lighted candle. Children dressed in white preceded the procession literally paving the streets with flowers. Between those files of flickering tapers and over the carpet of flowers the crown was conveyed to the great church for the ancient ceremony of Solemn Benediction. When the last chorus of *O Salutaris* and *Tantum Ergo* had died away to silence the moment of coronation of the Blessed Virgin was at hand, and the Archbishop placed the crown upon her head. Then a joyous chant of *Laudate Dominum* filled the plaza and the great cathedral while bells tolled and incense rose on the mountain air. Since then every year in an unbroken calendar for several centuries on December 8, the Feast of the Immaculate Conception, the Crown of the Andes has been placed upon the head of the statue of the Blessed Virgin in the cathedral of Popayan with pomp and ceremony to the rejoicing of the people.

The Crown of the Andes is a distinctive object. As a thing of beauty it stands out as superior to most of the contemporary crowns. It is an all-gold, all-emerald crown. It is somewhat smaller than full size and was not fashioned to wear as headgear. The crown is put on, not like a hat is put on, but is placed upon the top of the head. The circlet of the crown does not encircle the head. In more conventional crowns the circlet is a fitted band fashioned and suited to the particular head that is to wear it. The sides of the circlet rise vertically and the inner surface is padded with rich velvet and other appropriate materials for protection. The Crown of the Andes bears a circlet which slopes outward as it rises, which makes it unfit for supporting itself during movement of the head. It would likely slip down on the head and even come to rest at the ears. It might be conjectured, therefore, that this form was intentional in order to make the crown unwearable by any human being. The Crown of the Andes being somewhat smaller than conventional crowns may indicate that the statue of the Blessed

Virgin was less than life size, a very likely possibility. The circlet of the crown, as the picture shows, was essentially a continuous band of gold, wide and flaring outward. There was almost no open work in the band or any other part of the crown. Instead there are rounded protruberances, bosses, and a heavy primitive floral design with thickened areas, all of which adds greatly to the weight of the crown, due to the lavish use of gold. In the circlet there are frames and bezels for setting the emeralds. The circlet proper has an upper rim which is continued upward and flares rather widely. At this point four arches carry the gold work upward without change in the basic design. These arches rise in simple sweeping curves from the broad band without any definite base, making the whole crown a single skilfully contrived unit. Frames and bezels in the arches rise with the curves and accommodate a large number of the emeralds. The largest one of these is estimated to weigh around 45 carats, which by a conservative guess would be nearly as large in dimensions as one of our postage stamps. That is a large emerald by any standards. The arches, after curving gracefully upward and inward assume a very slightly reversed curve and narrow down almost to a point where they become confluent at the top and in a very slight depression, a nest, so to speak, into which a monde, or orb, is set. Immediately beneath there is open work in the gold leaving four spaces. It is said that 17 massive, pear-shaped emeralds, one in the center and four each in the corners formed by the arches, are suspended so that they meet at the top. Above the monde which symbolizes the Earth, there rises a cross of gold, set with emeralds, signifying the spiritual above the mundane.

Very little is known of the fortunes or misfortunes of the Crown of the Andes until the early years of the present century. The story goes that around the year 1910 the Czar of Russia, Nicholas II, became desirous of the beautiful diadem with its fabu-

lous wealth of emeralds and let it be known that he would like to buy it. The Russian royal family were all very fond of the emerald, a gemstone which they understood and loved. In fact they were avid collectors of emeralds, principally those from the Ural Mountains in their own country. They had become aware of the treasure of Popayan, whose emeralds were said to be the only collection in the world finer than their own. Then also the Russians had a streak of superstition: They disliked the color of rubies because it connotated blood. The emerald was clean. A deal like this between a reigning monarch and the occupant of the Vatican involving a semi-religious treasure probably had never before been made. The negotiations proceeded slowly and before they were completed World War I was imminent. Everything came to a standstill. Negotiations had been carried on by the Confraternity of Popayan, headed by Senor Tomas Olano y Hurtado, which had petitioned the Holy Father in Rome, Pope Pius X, to sell the crown which was considered the property of the Church. He had responded by the following document "The Vatican, June 17, 1914. The Holy Father, Pius X, having taken cognizance of the petition presented by Senor Tomas Olano y H. of Popayan, Patron and Syndic of the local Confraternity of the Immaculate Conception, and of the accompanying recommendation of the Ordinary, Archbishop Arboleda, for the reasons indicated has benignly deigned to authorize the above-mentioned petitioner to alienate the precious crown of the Immaculate Virgin, providing he leaves the manner and conditions, both of the alienation and of new institutions to the prudent judgment of the aforementioned Archbishop. The Cardinal-Secretary of State of His Holiness. (Signed) R. Card. Merry del Val." (Free translation from *Crown of the Andes*, Chicago, 1936). This document was later executed.

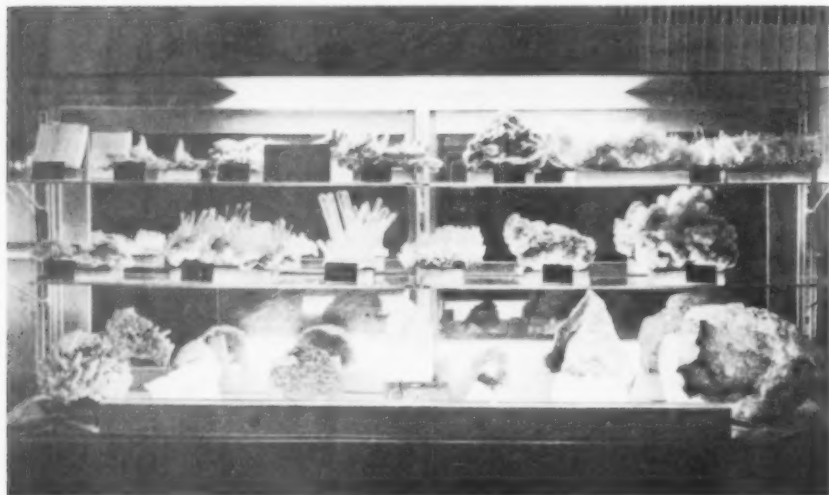
It is recorded that in 1925 a delegation of European jewelers formed a syndicate to negotiate the purchase of

the crown but they were not able to raise the necessary funds. In the meantime a new turn of events had been in the making. In 1915 the Panama Pacific Exposition opened in San Francisco. In charge of the exhibits of gems and jewelry was Warren Piper, a leading Chicago jeweler and gem dealer. He got acquainted at the Exposition with some knowledgeable persons from South America who informed him of the Inca treasure, the Crown of the Andes with its matchless emeralds, and its location in the city of Popayan. A true and dedicated lover of gems, especially the colored stones, he set out to acquire the crown and bring it to the United States. The price was so huge that a syndicate of substantial proportions had to be formed to undertake the deal. The project was slowly advancing but far from complete when the great depression of 1929 wrecked all plans and the crown remained in Popayan undisturbed. After the depression began to subside Warren Piper formed another syndicate and dedicated himself to the proposition that the crown should be brought to this country and kept in the Western Hemisphere, where it originated. His persistence was followed by success and on June 6, 1936, after 21 years of effort he took possession and title of the Crown of the Andes, in New York city. He had completed singlehandedly the largest jewelry transaction in the history of America.

AUTHOR'S ADDENDUM: Aside from newspaper clippings and publicity handouts I am indebted to the writings and personal communications of the late Warren Piper, who knew the Crown and its history best, for the story just told. I have presented here the story as it could be pieced together from a variety of sources, some of them legendary, no doubt. Tales are bound to grow with the retelling and sometimes fact and fancy overlap. I have tried to pick out those which to me seemed credible but cannot vouch for the story in its entirety. And what a fascinating tale it is!

HOW TO DISPLAY MINERALS

By REVEREND LUKE McMILLIAN,
O.F.M. CONV.



Display Case of Choice Mineral Specimens

How often have you visited a fellow rockhound's home to view his collection, only to find it a jumbled, disorderly confusion, with one specimen piled practically on top of the other? Often there is no label to tell you what a particular specimen is or from what locality it originated. Very often some superb specimen is even missed entirely because of the incongruous, crowded condition of the display. Here, then, are a few tips on displaying specimens that I have found useful. I hope they may be of help to you in setting up your own display.

The first problem is usually one of cabinetry. Display cases are, unfortunately, quite expensive. However, a person who has a valuable collection might consider proper cases worth the extra cost. You would not set a valuable gem, like a diamond, in a cheap ringband. Neither should we display fine specimens in a makeshift cabinet. Sometimes glass cabinets can be obtained from stores going out of business or moving to a new locality. Many

collectors build their own cabinets. If nothing else is available, book cases can be utilized. But even if the latter are used, glass doors should be installed in front. This will help keep dust off the specimens, and it will prevent the curious from touching the specimen. Have you not often discovered that when you tell someone not to touch a particular specimen because it is fragile, they will touch it to see just *how* fragile?

The next important question is how much space is available for the collection. Few of us are fortunate enough to have a sufficiently large room to display specimens to their best advantage. And so the first temptation you will have is to crowd your display. This is a temptation that must be resisted at all costs. Better to have ten well-displayed specimens than fifty all jumbled together. I like to space my larger specimens about two inches apart and my smaller specimens about an inch apart. If you have too many specimens for the case, try rotating them. Then

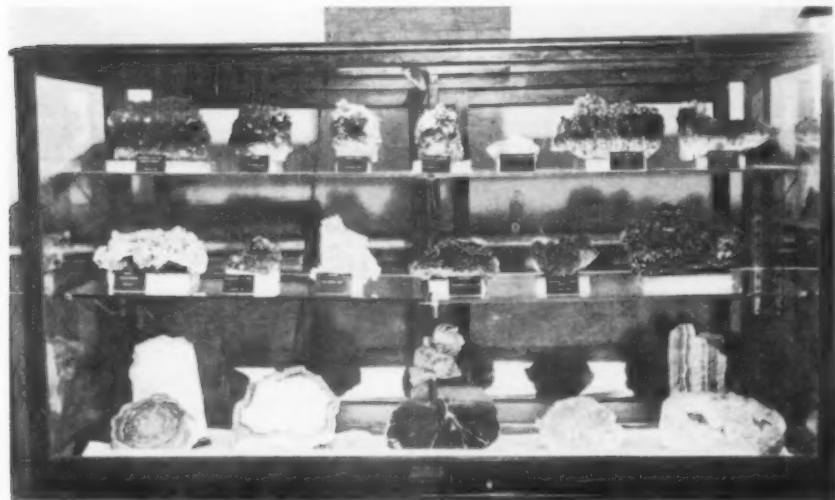
every time a friend visits your home he can enjoy a different display.

Proper lighting is also an important consideration. How often when viewing the collection of others have you not strained your eyes to see a beautiful specimen stuck way back in some dark corner of the display case? If possible, fluorescent lighting should be used. But even incandescent light bulbs can be screwed into sockets installed in such a way that the light does not strike the viewer directly in the eyes. One interesting display I saw used translucent slabs of agate to hide the direct light. This not only prevented squinting to see the collection, but also showed off the colorful patterns of the agate.

I like to use bases for my collection. I use one-inch styrofoam, which can be purchased at any floral shop. Not only does the styrofoam dress up the collection, but specimens can be pushed down into it and will stand up in any desired position. I spray the styrofoam with Royal Blue paint. But avoid the mistake of having bases that are larger than the specimen, unless you are an optimist and hope someday to replace the specimen with a larger one. It is the specimen that should occupy the center of attention, not the base upon which it rests.

Proper arrangement of the collection is also important. There are different methods that can be used, such as arrangement according to the type of mineral, different specimens from the same locality, etc. For example, one might group all the specimens that can be found in Michigan, or Wisconsin, into one group. Since I have different varieties of the same mineral, I group all calcites together, all varieties of gypsum, together, etc. But whatever method you choose, try to use a logical arrangement.

Next, we come to something very important — the proper labeling. Each specimen should have its own label giving the name, variety, and locality. Some collectors also include the chemical name. I find that labels 3X1½" are a good size. I type out my labels on a sheet of paper and then have a photostat copy made. This costs 75¢ for 18 labels. This reproduces the labels white on black and gives a professional appearance to the collection. The labels are cut out and glued on heavy paper. I put a paper clip on the back of the label with scotch tape, pull down one end of the clip, and the label will stand by itself at any desired angle. One can also type the data on black paper using white carbon paper, which can be purchased at most art stores.



Mineral Specimens Should Never Appear Crowded

Collectors, Can You Help

BROOKLYN BOTANIC GARDEN?

You can if you own a piece of granite with the dimensions of any one of those shown in the accompanying drawings. The largest is a rough 4 ft. cube; the smallest 1 ft. 3 inches long by 1 ft. 4 inches.

The stones should be granite, preferably dark grey or almost black. Note that the drawings of the stones show only above-ground portions, like the visible part of an iceberg.

In addition to the large stones whose form and dimensions are shown in the drawings, five additional small stones are needed. They should be of similar shape and appearance, but 12 inches or less across.

If you have or acquire one of the stones needed, please write to Director's Office, Brooklyn Botanic Garden, Brooklyn 25, New York. If there are financial considerations, please mention these in your letter. It is important that the large stones be near a highway or in an area where a truck can get in.

The story behind the appeal for these stones is an interesting one. Professor Takuma Tono of Japan is giving a series of courses on the horticulture of Japan at the Brooklyn Botanic Garden. He has conceived the idea of constructing there a replica of a famous garden in Japan, the Stone Garden at the Ryoanji Temple in Kyoto.

Kyoto, which dates from the eighth century, was the capital of Japan until 1868 when Tokyo became the seat of government. It is the site of many Buddhist temples of which the Ryoanji is one of the most beautiful. Five hundred years ago the monks of the Temple designed and constructed the Stone Garden as an aid in their search for understanding of life through the insight which comes through quiet meditation.

The Garden is tended and cherished to this day by the Buddhist monks, and Professor Tono wishes to duplicate it, as nearly as possible, on the grounds of the Brooklyn Botanic Garden. His purpose is to advance cultural understanding between the United States and Japan.

The Stone Garden is an abstract garden in which no plants grow. Its key points "for contemplation and quiet meditation" consist of five groups of large stones set in an area of what appears to be coarse sand — skillfully raked to suggest the sea.

Lucy Herndon Crockett writes of the Garden as follows in "Popcorn on the Ginza:"

"Or, there is the unique garden of the Ruan-ji Temple in Kyoto. To the baffled Western visitor for whom it is on one of the standard sightseeing tours this 'garden' is nothing more than a bleak walled-in rectangle wherein fifteen rocks are so spaced on immaculate white sand that never from any angle can all be seen at once. To a Japanese, however, this lifeless area symbolizes the spirit of Zen Buddhism in which the greatest spiritual release is found through the most elliptic expression, so that even words are despised as an inadequate vehicle of instruction in the inner truths that only intuition can discern through concentration and meditation."

Professor Tono has allies among poets and playwrights of the Western World who were sensitive to the value of inanimate objects in interpreting the order of the universe to our finite minds. Robert Browning wrote in "Saul" XVII:

"God is seen God
In the star, in the stone . . ."

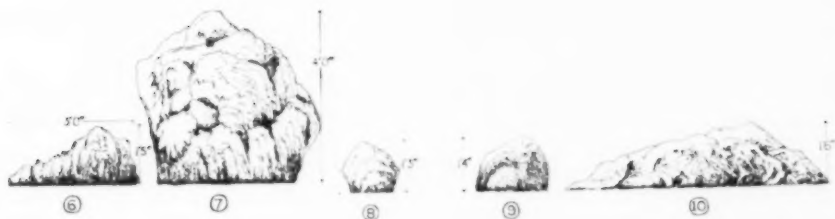
Shakespeare's Duke in "As You Like It" found "sermons in stones."

THE TEN MOST IMPORTANT STONES
IN THE GARDEN OF THE RYOANJI TEMPLE, KYOTO.

FRONT VIEW OF STONES:



SHAPE OF STONES, LOOKING DOWN FROM ABOVE



Stone Garden of the Ryoanji Temple in Kyoto as seen from the Viewing Pavilion.



Buddhist monk rakes fine stones into ripples simulating the sea. Large stone in the picture is No. 7.

Curator Chosen for Lizzadro Museum



Daniel Antolick

The Lizzadro Museum of Lapidary Arts at Elmhurst, Illinois, plans for which were featured in our August issue, is taking shape on many fronts. Below is a photograph of the building's framework as it appeared on our press date.

Of equal importance is the progress made in selecting personnel to administer the work of the Museum. We are pleased to announce that Mr. Daniel Antolick will fill the important post of curator. Mr. Antolick comes to the Museum from

Miami, Florida where he has been serving as director of the Miami Museum of Science and Natural History.

Mr. Antolick was born in Pennsylvania in 1919 and trained for his career at the University of Minnesota. Prior to accepting the Miami position he was assistant to the curator of the Minneapolis Science Museum. His outstanding skill in cabochon cutting and faceting will be a valuable asset in the Museum's program for teaching these arts.



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The Erwin Goetz Collection

By WILBUR L. HOFF

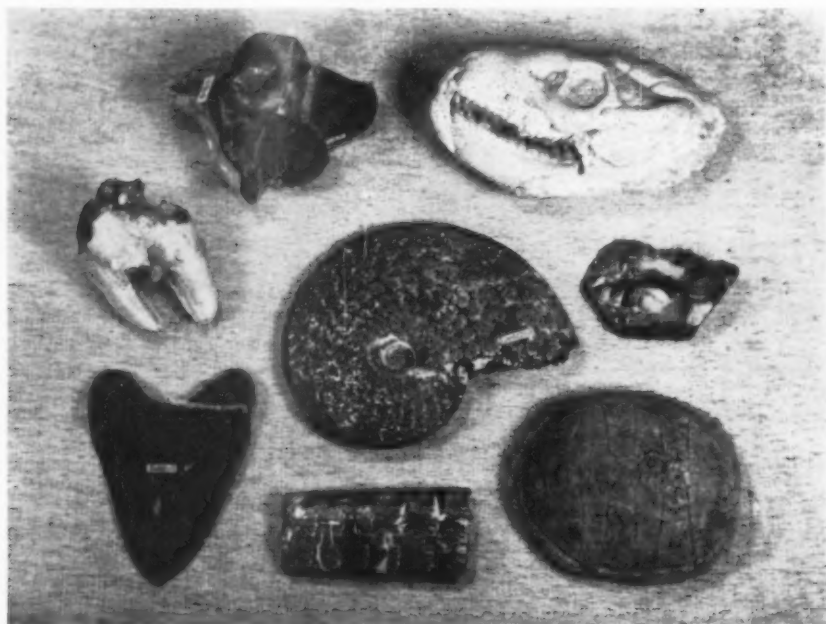


Mr. and Mrs. Erwin Goetz

The details of the initial formation of the Erwin Goetz collection have been lost with the passage of time. Mr. Goetz played such an important part in preserving and expanding the collection, however, that his name is inseparable from it. Fate must have had a hand in the chain of events which

led to its acquisition by a man of the unique intellectual curiosity which Erwin Goetz possessed.

My own part in subsequent events bearing on the collection was not without coincidence. After a day's work of checking the orientation, cutting, lapping, and X-raying of quartz cry-



Choice Fossils From Bad Lands

stals to correct radio frequency, I stepped off a Burlington commuter train at Riverside, Illinois. It was January of 1944 and those quartz crystals were destined to enable bomber pilots to correlate the air attacks on Tokyo.

A friend, George Horne, and I prepared to follow our evening ritual of cutting across a vacant lot to the sidewalk along which we walked to the neighboring suburb of Hollywood where we lived. Unknown to us, there was a hole in the lot about ten inches across and a foot deep covered over with long blades of dead grass. That evening I stepped into the concealed hole. In an effort to keep from falling I stiffened my ankle. A snap like a stick breaking and a sharp pain indicated trouble. That broken bone in my ankle was one of the luckiest misfortunes of my life.

The long days of convalescence at home afforded me time to study and cull out the thousands of specimens of fossil ferns which I had been collecting at the strip mines around Coal City, Illinois. There were so many

medium-good samples left over that I decided to sell some if possible. A one-inch ad in the March 1944 Mineralogist offered these at five pair for \$1.00 postage prepaid. The response from all over the United States and Canada was overwhelming. Dozens of rockhounds ordered and re-ordered and spread the word. Months later I was still shipping hundreds of specimens by parcel post, railway express and by freight. Because of the supply situation, prices went up higher with each quotation and subsequent shipment.

Erwin Goetz of Chicago saw the ad and ordered. He re-ordered more varieties. My first meeting with him was arranged by Steven T. Norvell, a well known "ESCONI" geologist, at Erwin's home. Both were then members of the Marquette Geological Society in Chicago.

On this visit I saw rare specimens of hematite from Cumberland, England; colorful agates from Uruguay; outstanding Oligocene Bad Lands fossils such as Placenticerans, oreodont skull, titanotheres teeth, etc., and a

splendid collection of faceted natural gemstones which had been added after the original collection was acquired. All of these hundreds of specimens were labeled, listed and classified in a most orderly fashion in folders giving names, locality, chemical formulas and geological horizon. Questions uppermost in my mind were how, when and where did our host acquire these specimens?

Here is the history of the man and the events leading up to his acquiring the nucleus of a priceless geological collection which inspired him to study geology, paleontology and mineralogy and add new specimens in accordance with an arrangement he worked out from his studies of Dana and other literature on the subject.

Erwin Goetz is a native of Stuttgart, Germany, presently living at 801 13th Street North, St. Petersburg, Florida. His father was an importer and agent between import houses and cotton mills in Germany who had connections in many parts of the world including New Orleans and Houston, U.S.A. An uncle of his emigrated to the United States at an early age and settled in Sacramento, California.

Through correspondence with him, Erwin learned about our national parks, the San Francisco earthquake of 1906 and the American Indians. In his retirement years Erwin is now studying the history of the American Indians and classifying the tribes and subtribes and their locations with the same thoroughness he practiced in arranging his geological collection.

As a boy Erwin collected rocks and became interested in geology and related scientific subjects. His education was interrupted by World War I when he became an infantry man in the German Army in 1915. By the end of the war he was seriously injured in both legs by shell bursts and had won the Iron Cross and silver honorary medal for outstanding bravery and service. In 1923 his sweetheart, Paula, emigrated to Charles City, Iowa. She soon found a sponsor who enabled Erwin to come to the U.S.A. and they were married in the same year. He became a citizen in 1929 and took a position with a company in Chicago as manager of a large number of apartments.

In 1938, his firm gave him orders to clear out the basement storerooms to



Miscellaneous Specimens From Goetz Collection

avoid fire hazards and install laundries for the use of tenants. All unnecessary things were to be disposed of including nine nailed-up beer cases, each of much greater weight than any filled wooden boxes of that size should weigh.

The janitor, not being able to lift the boxes, opened one of them, and found it filled with what he called "rocks of all kinds." He first asked Erwin's employer, Mr. Crilly, what to do with the stuff and was ordered to throw it all in the ashbin. However, knowing that Erwin was interested in all kinds of hobbies and collections, he asked him to take a look at the opened box, at the same time showing him a specimen of what he thought was gold. It was "Fool's Gold" or iron pyrite. After inspecting the contents of the opened box Erwin instructed the janitor to wheel all of the heavy cases to his basement.

The rocks were wrapped in old newspapers dating from the Columbian Exposition, the World's Fair of 1893. A considerable part of the collection had been on display at the Exposition before it was packed away. Erwin looked in vain for a listing of the rocks but found none. In an effort to trace the history of the collection he found that an old widower who had been a prospector for many years, i.e., 1860 to 1890, had lived in one of the apartments since the Columbian Exposition and had passed away long before the boxes were discovered.

From this time on Erwin spent endless hours of study, visiting the neighboring Lincoln Park Natural History Museum and the Field Museum to identify the material. He joined the Chicago Mineralogy Society and the Marquette Geological Society. He studied Dana, Index Fossils, and other authoritative books on the subject and originated a comprehensive outline in which to fit all of the present and future geological samples he might acquire.

He became so fascinated by his project that he lost much needed rest and sleep.

Eventually, he developed a serious

heart condition and was advised by his doctor to sell the collection so that he would not be tempted to continue the extensive overtime work that could bring on a serious attack.

After considerable time and effort were expended to sell the collection to local colleges, schools or individuals without avail, Erwin finally offered the collection, lock, stock and barrel, to the author for a very reasonable sum. Display cases, books, charts, and five large folders containing the outline and listings of the then known rocks and minerals were included along with the specimens themselves. The classification scheme, although not based on the new Dana system, was sort of a "Rock of Gibraltar" from which I could continue the listing of the many tons of my own geological material.

Incidentally, both collections, all nine tons of them, were moved from Chicago, Illinois to Buffalo, New York and back again to Chicago between the time I acquired Erwin's collection and the writing of this article.

Eventually, when a powerful enough booster has been developed, the best part of both collections may be orbited to some western or southwestern state and be on display in my own private museum where the public may have the privilege of viewing it in my retirement years.



Never mind looking up that rock I found—one of the girls in my circle identified it.

Christmas Chapel—Grotto of the Redemption

By Russell Kemp



Manger Scene a Work of Fine Art

Above is a picture of the remarkable Christmas chapel scene in St. Peter and Paul Church at the Grotto of the Redemption in West Bend, Iowa. To give you some idea of perspective, we would like to call attention to the fact that the statues kneeling in the foreground in the lower front of the picture are actually life size.

Many of our readers will have the opportunity of visiting this famous Grotto in 1962 while attending the Midwest-American Federation Show and Convention to be held in Des Moines July 26 through 31, hosted

by the Des Moines Lapidary Society. In all probability guided field trips will be made to the Grotto during the Convention.

The monumental marble statuary shown in the picture, as well as other statuary throughout the Grotto itself, was carved in Italy of flawless white marble mined in the Apennines Mountains by the very finest sculptors available at the time.

The monetary value of the Chapel itself has probably never been estimated, but it has been noted that the pearls in the necklace pictured are perfectly matched. The pillars and

manger are encrusted with precious stones and gem materials. The dark mass seen above the animal heads is a large specimen of amethyst crystal in a cluster weighing more than 300 pounds, and many of these crystals are of faceting grade. It has been said that it could not be duplicated for many thousands of dollars.

Naturally most everyone asks, "What about the Cloisonne vase?" This was a very special gift to the Grotto some time ago and it was then felt that the manger scene would be the proper place to display this superb work of art represented as a gift to the Infant Child Jesus lying in the manger. There are also many very fine pieces of Oriental carvings that were received as gifts and placed in the scene.

Should you desire further information on this world famous Grotto of the Redemption, we would suggest that you read the complete article about this fabulous place in the August 1959 issue of EARTH SCIENCE, or write to the Grotto in West Bend for a copy of one of the attractive descriptive booklets.

RECOMMENDED READING

"Trilobites Can be Found in the Tulsa Area," by Joe Welch. September issue of *The Stonebruisers*. (Edited by: Margaret Harris, 4504 N. Charlotte, Kansas City, Mo.) Gives directions to 15 trilobite bearing formations near Tulsa, Oklahoma.

UTAH COUNTIES—1961

Are you interested in traveling in Utah and knowing what best to see? Then you should have a copy of this 70 page, beautifully illustrated booklet at your command before starting, for it tells "all about it." Write Utah Counties Magazine, Kaysville, Utah (published annually).

NORTHWEST FEDERATION OF MINERALOGICAL SOCIETIES' Judges Training Classes conducted by Helen Rice and Bob Hagglund were held in 10 cities and attended by 287 members. Helen Rice is a past president of the American Federation and Bob Hagglund is Chairman of the American Federation's Uniform Exhibit Rules Committee.

Around the SUPPLIERS' CIRCUIT

"Moving to larger quarters" has been the theme of several communications to us recently. Bert Cole is now at 9515 Barbur Boulevard, Portland, Oregon; the Ebelings at 10837 Morena Avenue, Lakeside, California; Francis Hoover at 12449 Chandler Boulevard, North Hollywood, California; and S and W Rock Shop at 1156 W. Leonard Street, Grand Rapids, Michigan. For prompt mail delivery, note the new addresses.



Remember the Jewetts and Paiges? Harvey Shull, pictured above, used to sell them on Des Moines' auto row right after World War I. The law and banking also figure in Harvey's background. But right now, 76 years young, he is deep in the rock business on the north edge of Oskaloosa. Winter finds him in the Southwest or in Mexico hunting the specimens for which his shop is well known.

Raytech Equipment is a new name for the same nice people who formerly did business as Mineral Equipment Company. No address change, still Somers, Conn.

We were glad to see our hard-traveling Texas friends, the Harry Simpsons, come north from Granbury to both the Saginaw convention and the Indianapolis Rockrama.

The Victors of Spokane are still at South 1709 Cedar but are enlarging and taking on help to handle their growing business. "So You Want to Start a Rock Rock" has gone into its second printing.

Faceting Is Easy

By ALVIN E. ERICSON



Part I. General Principles

POSSIBLY you do not agree with my title but I think that if you will carefully go through with me the various steps in learning how to facet, you will find that faceting is really no more difficult than cutting a cabochon.

To start with, a faceted gem differs from a cabochon in that, instead of the face of the gem being ground and polished in a rounded oval shape, it is cut with a number of flat surfaces called facets which are arranged in a symmetrical manner. To get the facets aligned properly on your stone it is necessary to use a mechanical faceting device. There are a number of faceting devices on the market from which to choose. I am not going to discuss the merits of the different makes, but will try to point out some of their important features as we proceed with our discussion.

You will find that most faceting units operate on the same basic principles. So let's look at a typical faceting head and learn how it works—before we try to cut any stones. Most types of faceting units have a vertical stand rod on which the faceting head can be raised and lowered. See Draw-

ing A. The height at which the faceting head is set above the surface of the horizontal cutting lap determines at what angle the facet will be cut. This angle is shown by a pointer on the protractor scale, often called a facet angle scale, which is graduated from 0 to 90 degrees.

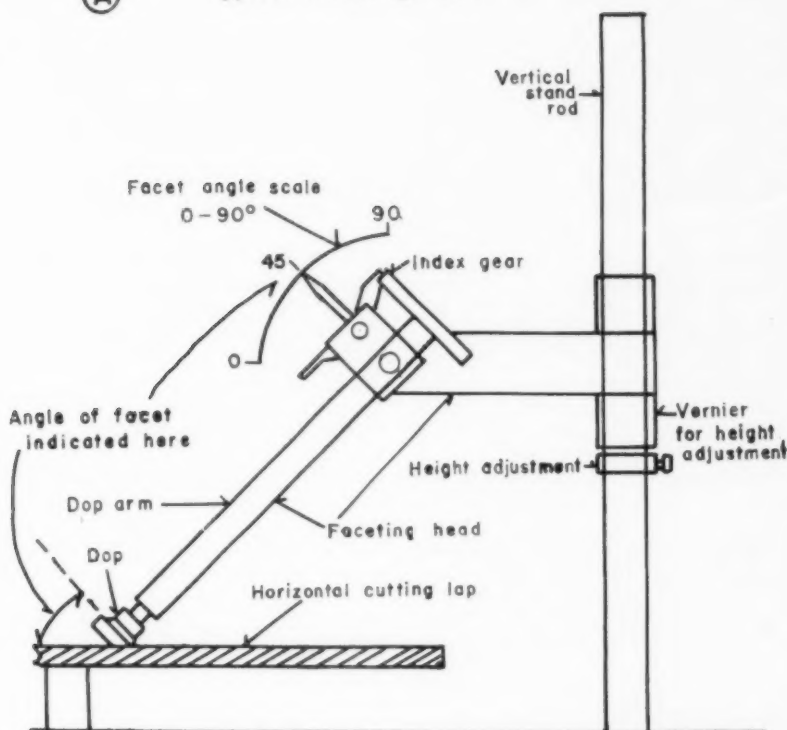
In addition, the typical faceting head has an index gear which may have from 32, 64, and up to 96 divisions, actually a graduated tooth gear. Most of the standard faceted gems can be cut with the 64 tooth gear unit. Let us take the 64 tooth gear and divide it into eight equal divisions such as—8, 16, 24, 32, 40, 48, 56, and 64, as shown in Drawing B. If you will mark these eight numbers with a long bar it will help you to find them quickly when you are cutting the various facets. As you will see later the *MAIN* facets on most of the standard cuts are made on these eight divisions. In fact, you can forget all about index numbers after you gain a little experience in faceting because the facets on most standard cuts are always arranged in symmetrical rows around the stone. Look at your wife's engagement ring.

Now we are ready to discuss cutting the facets. The first major step in faceting consists of setting the height of the faceting head so that the angle of the facet being cut is the one recommended for the material. Charts and tables have appeared in various publications giving the angles used for the different rows of facets in cutting gems from a large variety of different materials. For the moment we will dismiss these tables from further consideration because by the time you have learned how to cut a few stones you will most likely understand how to use these charts. Notice in Drawing A that the angle of the facet being cut is shown by the pointer on the facet angle scale. Once you have set the proper angle you can then position the facets one by one — simply by rotating the Dop Arm to the points required on the index gear. You can then proceed to cut each facet merely by lowering the stone to the surface of the cutting lap and holding it there until the facet has been cut to the desired depth. After you have cut the 4, 8 or more facets called for in a particular row, the head is raised or lowered to give the new angle for the next row of facets. These facets are then cut at the index points called for in this row. If you will just remember that most standard faceted stones are cut with several rows of symmetrically arranged facets, I am sure you will find it easier to understand how to go about cutting a faceted gem.

Now that we have discussed some of the general principles on which a typical faceting unit works, we will spend a few moments talking about the laps that are used to do the cutting. As you can see in Drawing A, the cutting lap is a horizontal rotating disk. Silicon carbide or Norbide grit is often used on the surface of the metal lap for cutting the facets. However, I have found them extremely messy. The loose grit gets on the faceting unit, your hands, and on the table on which your unit is mounted. Each time you change the grit size or prepare for polishing, everything has

to be scrubbed and loose grit removed before you can proceed. Instead, I prefer a diamond charged lap because it eliminates this mess and I have found it to be the best investment in the long run. You can purchase a lap charged only on one side such as a 400 grit diamond — which will give satisfactory results as it will cut fairly fast and still cut fine enough to permit polishing many gem materials satisfactorily. Or, if you purchase a lap charged on both sides, the 200 grit diamond on one side permits very rapid roughing in of the main facets, and the 600 grit diamond on the other side permits very fine cutting of small facets after the main have been roughed in. While you may invest as much money initially in a diamond-charged lap as you would in a diamond sawblade, you will find that the lap lasts a long time and can be recharged again at a nominal cost. I have used my 400 grit diamond lap for almost two years and it is still cutting on the original charge.

The speed of the lap is not critical. I have found that speeds of 500 to 600 RPM for a six or eight inch lap give good results for both cutting and polishing. You may find that while you are learning to cut your first facets that a slower speed of 100 to 200 RPM will help you to get your facets the correct size. The slower speed does not cut as fast and there is less danger of over-cutting the facets. However I would recommend that you start faceting right away at the higher speed and develop your touch and skill. In cutting the small facets on a stone, the lightest touch is all that is necessary to cut the entire facet in a second or less. After you develop your skill, you should be able to cut all the facets on either the top or the bottom of a medium size stone in 10 or 15 minutes, ready for polishing. Let's start on a rectangular step cut stone as our first venture. I suggest this cut as a starter because it has the minimum number of facets and is quite easy to understand. It will help you to become familiar with the operation of your faceting head so that later when you start more

(A)**Typical Faceting Unit**

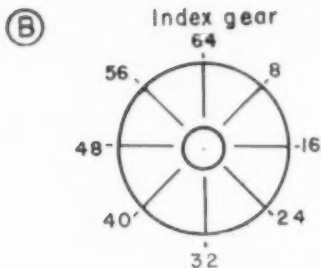
difficult cuts you will know how to use your equipment and can at that time concentrate on cutting the more complicated shapes. Start by grinding a rectangular preform, as shown in Drawing C, from a piece of clear quartz crystal or an inexpensive grade of beryl. Do not attempt to cut a valuable piece of material on your first try. Save it until your cutting skill is worthy of the stone. Good quality material is quite hard to get and is rather expensive.

The rough preform can be ground by hand on a regular 100 grit grinding wheel after it has been sawed to the approximate size. Do not try to grind your preform too close to the finished size of the stone. You are simply trying to get rid of excess material before you start cutting on the diamond lap. Note the dimensions in Drawing C for the height and thickness of the pre-

form. Make your preform from $\frac{1}{2}$ to 1 mm. larger than the size of the finished gem. Thus a preform for an 8 x 10 mm. stone should be about 9 mm. wide and 11 mm. long by about 9 mm. high. As you gain experience in rough grinding the preforms you can make them closer to the finished gem size.

A few comments about dopping your stones are in order at this time. Some dopping waxes used for cabochons are not suitable for faceting because they are too soft. I have found Dennison's Express 4 and a special green wax prepared especially for faceting and supplied by Grieger's of Pasadena, California satisfactory. There are undoubtedly other types that are also suitable.

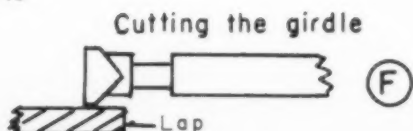
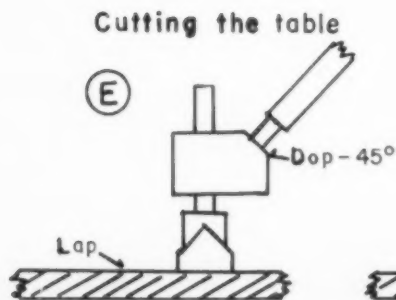
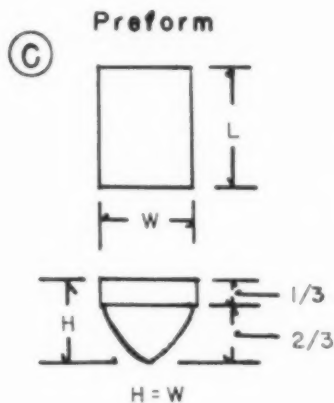
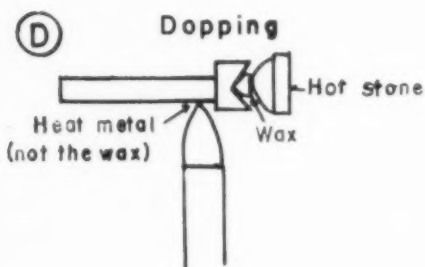
To dop your stone properly the preform must be heated until it is quite warm. Hot enough so that you can barely pick it up without burning your



fingers is about right. Melt a little wax into the end of the metal dop and heat the dop only, just below the wax, as shown on Drawing D, until the wax flows quite freely over the end of the metal dop. Do not burn the wax or let it catch fire because that weakens it. Now press the hot preform into the hot wax and align the stone so that the table of the preform is perpendicular to the metal dop. Reheat the stone and the metal dop until the wax flows freely onto the faceting preform. Only when the wax is glossy and shows that it has flowed onto the preform, will your stone adhere firmly enough to the

dop to go through all the cutting-polishing operations without coming off before it is finished. Once a stone comes off the dop, you have lost the alignment of the facets with the index numbers and the facet angles at which they were originally cut. If such a catastrophe should occur on your first stone, I would advise redopping the stone and recutting all the facets. Actually after you develop a little skill you will find that it will take you only a few minutes to recut the stone.

With the stone dopped, we are now ready to cut the table or top surface. A 45 degree dop holder is used to per-



mit cutting the table exactly perpendicular to the dop. Look at Drawing E. Insert the 45 degree dop in the dop arm but do not tighten it yet. Raise the faceting head until the 45 degree dop is perfectly flat on the lap and the facet angle pointer is at 45 degrees. Tighten the set screw or chuck to hold the 45 degree dop firmly in place. Insert the dop with your stone in the 45 degree dop and raise the faceting head until, with the table of the stone on the lap, the facet angle again reads 45 degrees. Apply water to the surface of the diamond lap either with a cloth wad dipped in a dish of water or let the water drip very slowly from a container fitted with a petcock, above the lap. *NEVER* put a stone down and cut on a dry lap, because it will gouge your lap. Now start the motor and then press the stone gently against the lap for a few seconds. Raise the dop arm and take a look at how much you have cut. If you do not have a flat surface across the entire table of the stone, cut a little more. At this point let me give you a bit of advice which I hope you will follow faithfully from this point on:

Cut a *LITTLE* and *LOOK* often. This is especially important until you develop some skill. When a nice flat surface has been cut for the table, remove the 45 degree dop from the faceting head.

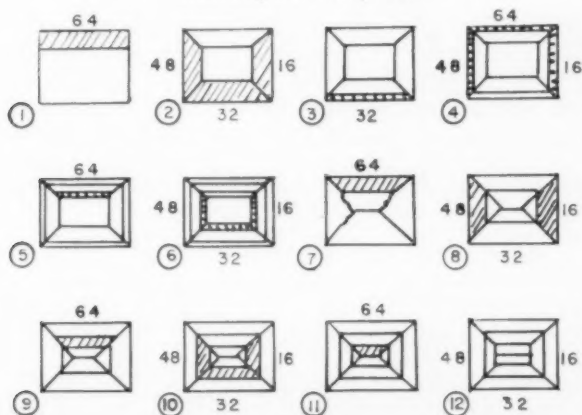
You are now ready to insert the dop

with your preform in the dop arm of your faceting head. First swing the dop arm to a horizontal position. Then lower the faceting head on the stand rod until the dop arm is almost touching the surface of the cutting lap. Now insert the metal dop in the dop arm, and with the longest side of your preform pressed against the surface of the cutting lap, tighten the set screw or chuck to lock the dop securely in place. The index gear must be set on 64 when you are inserting the dop; thus one of the long sides of your gem will be aligned with Index 64.

We are now ready to cut the four sides of the stone at an angle of 90 degrees for the girdle. If possible, the faceting head should be slid far enough away from the lap so that the head can be lowered far enough to cut at a 90 degree facet angle with the side of the stone on the edge of the cutting lap as shown in Drawing F. Cut enough to get a flat surface along the entire side of the stone. Now, rotate the dop arm to Index 16, cut the end; Index to 32, cut the side; Index to 48, and cut the other end. You should now have a perfectly rectangular preform. If you are cutting the stone to a specific size such as 8 x 10 mm. you should check the size. If necessary cut some more until you have the right size.

Now that you have the table and the four sides for the girdle cut, we can
(Continued on page 270)

Rectangular step cut



Geode Industries Celebrates Twenty-Fifth Year

The vitality of earth science as an avocation is evidenced by the completion in 1961 by Geode Industries of New London, Iowa of twenty-five years of service.

The business was founded in 1936 at its present location by Mr. E. N. Smith. Throughout the depression years of the 30's Mr. Smith employed two men for the sole purpose of digging geodes. Trees have now grown up in the old beds used during those years and it is impossible to dig there now. However, the depressions of the old geode pits still remain on the hillsides.

At first the geodes were made into ash trays and book ends and these were sold throughout Southeastern Iowa, Missouri, and Illinois, together with some geode specimens. Occasionally a sale would be made to a touring rockhound family.

In the early 1940's and throughout World War II, activities had to be more or less confined to a local level. After the war a big step forward was taken in the form of advertising in the national gem and mineral magazines. Business expanded rapidly. In recent years the floor space of the shop has been tripled to the present 4,000 sq. ft. Further expansion will soon be necessary.

Geode Industries is still digging geodes out of the Iowa hills but now is also a prime supplier of minerals and all kinds of lapidary equipment and supplies. Mr. E. E. Smith has succeeded his father, founder of the business, as its active supervisor.

Congratulations and best wishes for your second quarter-century!

(Continued from page 269)

start to cut the rows of facets around the top of the stone. Raise the faceting head until, with the Index gear set at 64 and the stone resting on the cutting lap, the facet angle reads about $42\frac{1}{2}$ degrees. Lift the stone off the lap, start the motor, wet the lap, and cut the first facet as shown in Illustration 1 for the Rectangular Step Cut. Continue cutting until this facet has cut away a little less than $\frac{1}{4}$ of the table of the stone. Check the facet angle again and if it is not exactly on

42 degrees, use the Vernier height adjustment to get the angle just right. A smoothly operating Vernier adjustment for accurately setting the vertical height of your faceting head is very important. Now Index to 16 and cut the facet on the end of the stone. Cut until this new facet exactly meets, at the corner, the one you just finished cutting. Index to 48 and do likewise. Index to 32 and cut the remaining side until it exactly meets the two end facets. Your stone should now look like Illustration 2. These are the *MAIN* facets on the top or crown of your stone. Next lower the head and with the index at 64 set the height so the angle of the facet you will cut next is 50 degrees. Index to 32 and cut for just a second on the wet lap. This facet should be quite small and is completed with just a touch to the diamond lap. It should look like Illustration 3. Continue to cut matching facets as shown on Illustration 4 at Index numbers 16, 48, and 64. These are called the *Girdle* facets. Next raise the faceting head until you will get a facet cut at a 30 degree angle. This is the star row of facets. Again cut with only a touch to the wet diamond lap to make a very small facet as shown in Illustration 5. Cut matching facets as shown in Illustration 6 for Index settings of 16, 48, and 32. Make sure in cutting that you match the sizes of all facets in the row you are cutting for each angle setting. By this time I think you will have noticed that you turn the dop arm $\frac{1}{4}$ revolution in going from one facet to the next one and that we have used only four of the eight Index points we marked with long bars.

You have now completed cutting the top side or crown of your stone and are ready for polishing. This will be done on a well-scored lucite lap with cerium oxide as the polishing powder. I will talk about polishing in the next article in this series and will also tell you how to transfer your stone to another dop on a transfer block so that the bottom side can be cut and polished as shown in Illustrations 7 thru 12.

(N.B. Parts II and III of Mr. Ericson's article will appear in succeeding issues of Earth Science.)

New Dual Speed Model No. 76-5 Tumbler features a solid cast polyvinyl barrel in which stones tumble easily and quietly without chipping. Seamless and flexible for cleaning ease. Fully enclosed. Belts and pulleys bearings, and with a new belt drive and air-cooled 1/40th H.P. motor. Dual speeds are available with 25 R.P.M. for roughing operations and a 16 R.P.M. speed for the polishing operation. Vinyl barrel will handle 6 lb. load with ease. This is a tumbler that will stand up under continuous operation and give professional-like results. Priced within the reach of every hobbyist.

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Midwest Club News

Mrs. Bernice Rexin, Club Editor
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DUNELAND ROCK CLUB recently entered an exhibit of fossils, minerals, geodes, and crystals at the Lake County Central States Fair and received a second place ribbon in the organizational division. Earlier the club's entry won a first place ribbon in a hobby show at Gary, Indiana.

RACINE GEOLOGICAL SOCIETY met at the Wustum Museum in September for its annual review of its members' rock-hunting vacations and to admire an exhibit of new additions to its members' collections.

AUSTIN GEM AND MINERAL SOCIETY held its Junior show on Sept. 28. There were many nice displays and first, second and third prizes were awarded. Lee Gregor, the Society's Liaison Officer, gave an interesting talk on "Amethyst," relating from whence it came, how it derives its beautiful color, and many other facts about this lovely gem stone.

SHOW-ME ROCKHOUNDS ASSOCIATION at its August meeting viewed "Coral Wonderland," a colored film of the Great Barrier Reef of Australia. The film was shown by Bob and Betty Raines who also presented some petoskey stones (fossil corals) to the group.

INDEPENDENCE GEM AND MINERAL SOCIETY cleared \$172.02 on a rummage sale held to raise money to finance its November 4 and 5 rock show, the first commercial rock show in the Kansas City area.

EVANSVILLE LAPIDARY SOCIETY is considering adding a new slab saw to its lapidary equipment. This equipment is available to all members, over 15 years of age, on regular supervised shop nights.

NEBRASKA MINERAL AND GEM CLUB has been invited to help establish a Natural History Museum in Omaha, Nebraska. It has been suggested that the society furnish an exhibit of rocks, minerals and fossils for the Museum. The exhibit would remain the property of the Club or contributing members.

CENTRAL IOWA MINERAL SOCIETY announces that the mineral and gem collection of the late Halver Straight, willed to the society, has been loaned to Drake University. It is housed on the third floor of Old Main Building at Drake and is open to the public.

CIMS gives a one-year subscription to Earth Science as a door prize at each of its meetings. Dr. Donald L. Briggs, Geology Professor at Iowa State University, spoke on "Crystals" at their October meeting.

FOX VALLEY ROCKS AND MINERALS SOCIETY has scheduled a series of four half-hour talks on geology this fall. The talks will be presented by Dr. Clarence Smith, well known geologist and educator. Dr. Smith is the geologist who identified and classified the mastodon bones which were found when Mastodon Lake was excavated in Phillips Park. Titles of the lectures are: How Old is Old?; What's Under Aurora?; Trilobites and Dinosaurs; and The Ancient Ferns of Madison.

GRAND RAPIDS MINERAL SOCIETY on Sept. 13 heard Tolson Radlof, noted silversmith, give a demonstration talk on "Silversmithing."

TRI-COUNTY ROCKS AND MINERALS SOCIETY'S trophy for finding the best new source of polishing material in Michigan was awarded to Florence Mickey for her discovery of epidote in the Grand Traverse Bay area.

MIAMI VALLEY MINERAL AND GEM CLUB was host to the Columbus Rock and Mineral Club during a recent visit to Indiana for geodes and gold panning. The September issue of the Club's bulletin, *Chip & Lick*, contains an excellent article on geodes, The Heart of the Geode Land, by Maurice Lamb. It deals with the varieties of inclusions found in the geodes of eastern Iowa and western Illinois.

MICHIGAN GEM AND MINERAL SOCIETY recently enjoyed the easiest collecting trip of the year, a trip to its president's home to collect free mineral specimens. President William Barnhouse is reducing the size of his collection and is generously donating his excess specimens to the club's members.

KANSAS CITY LAPIDARY CLUB has received a gift of ten pounds of turquoise from Mr. and Mrs. Orin Resseque for its new work shop, which was officially opened during August.

TRI-STATE GEM AND MINERAL SOCIETY OF DUBUQUE on Sept. 10 made a field trip to two nearby quarries to collect Silurian fossils. In the first quarry the fossils have leached out of the limestone and are either loose or stand out in relief. The second quarry contains an abundance of the brachiopod *Pentamerus* which is the fossil index of the Mid-Silurian. Its presence dates the rock as being 350,000,000 years old.



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CENTRAL MICHIGAN LAPIDARY AND MINERAL SOCIETY made a field trip to the quarries of the Medusa Portland Cement Co., at Silica, Ohio on Sept. 16 and 17. Trilobites, crinoids and different types of brachiopods are found here. Some of the brachiopods have been replaced with pyrite and are a beautiful golden color when cleaned with acid.

FLINT ROCK AND GEM CLUB'S first fall program featured colored slides and comments about collecting areas in the province of Ontario. It was presented by Al Draws and Clarence Chollers.

SHAWNEE-MISSION GEM AND MINERAL SOCIETY visited Mt. Ida, Arkansas over the Labor Day weekend to collect quartz crystals. The crystals line each side of veins running through the massive sandstone. If care is used, beautiful, unbroken clusters can be hammered free. Partially broken pieces, left behind by the commercial dealers who have mineral rights in the area, can be picked up from the ground.

The society reports that selenite roses are plentiful in the gypsum deposits in the hills south of the Apache Powder Plant at St. David, Arizona.

CHICAGO LAPIDARY CLUB'S bulletin, *The Template*, has initiated a question and answer section on faceting. Sample: Q. How do I judge the color of rough crystals so as to get the best color in my finished gem? A. Under a bright light, lay the pieces of colored gem material on a pure white background. Looking down on the stones, observe their color, the color you see will closely approximate the color of the finished gems.

MICHIGAN MINERAL SOCIETY at its October meeting featured a talk on "Crystals," by a student member, Roger Weller. Recently Mr. Weller's exhibit of twin crystal models and specimens of each of the six crystal systems won a second place award at the Detroit Science Fair.

MUSKEGON COUNTY ROCK AND MINERAL ASSOCIATION planned to visit quarries in Ohio during October to collect fossils, calcite and blue celestite. Recently the society voted to host a Midwest Federation Rockrama during 1962.

MINNESOTA MINERAL CLUB reports that Thomsonite Beach at Grand Marais, Minnesota is being readied for a children's camp and is posted with no trespassing signs. The only remaining access to this famous Thomsonite collecting area is through a trail over a narrow strip of land owned by the State. The club has discussed purchasing what land is still available in this area, but decided against it because the cost of maintaining it as a collecting area would be too great.

STATEMENT REQUIRED BY THE ACT OF AUGUST 24, 1912, AS AMENDED BY THE ACTS OF MARCH 3, 1933, JULY 2, 1946 AND JUNE 11, 1960 (74 STAT. 2061) SHOWING THE OWNERSHIP, MANAGEMENT, AND CIRCULATION OF Earth Science, published bi-monthly at Mount Morris, Illinois for December, 1961. 1. The names and addresses of the publisher, editor, managing editor, and business managers are: Publisher, Earth Science Publishing Company, Inc., L.R.1357, Chicago, Ill.; Editor Ben Hur Wilson, 406 Grover Street, Joliet, Illinois; Managing editor William H. Allaway, 4729 Prince Street, Downers Grove, Ill.; Business manager J. Daniel Willemis, 29 So. La Salle Street, Chicago, Illinois. 2. The owner is: If owned by a corporation, its name and address must be stated and also immediately thereunder the names and addresses of stockholders owning or hold 1 percent or more of total amount of stock. If not owned by a corporation, the names and addresses of the individual owners must be given. If owned by a partnership or other unincorporated firm, its name and address, as well as that of each individual member, must be given. Earth Science Publishing Company, Inc. P. O. Box 1357, Chicago, Illinois; Ben Hur Wilson, 406 Grover Street, Joliet, Illinois; William H. Allaway, 4729 Prince Street, Downers Grove, Illinois; J. Daniel Willemis, 29 So. La Salle Street, Chicago, Illinois; Earl D. Curwell, 5426 Carpenter Street, Downers Grove, Illinois; Russell Kemp, 19 E. 144th Street, Riverdale, Illinois; Bernice Rexin, 3243 N. Sherman Blvd., Milwaukee, Wisconsin. 3. The known bondholders, Mortgagees, and other security holders owning or holding 1 percent or more of total amount of bonds, mortgages, or other securities are: If there are none, so state. None. 4. Paragraphs 2 and 3 include, in cases where the stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting; also the statements in the two paragraphs show the affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner. 5. The average number of copies of each issue of this publication sold or distributed, through the mails or otherwise, to paid subscribers, during the 12 months preceding the date shown above was: (This information is required by the act of June 11, 1960 to be included in all statements regardless of frequency of issue.) 3250. Ben Hur Wilson, editor.

Sworn to and subscribed before me this 23rd day of October, 1961.
 Mary M. Low, Notary Public
 [SEAL] (My commission expires June 18, 1964.)



Important Coming Events—1961

November 18 and 19th. The St. Louis Mineral and Gem Society will hold its 2nd Annual Mineral and Gem Show at the "Town & Country Mall," Page Ave. and Woodson Road. The outstanding feature of the Show will be the Competitive and Non-Competitive Exhibits by the Society Members. Several Dealers will have booths. Free Admission . . . Food Available . . . Plenty of Free Parking.

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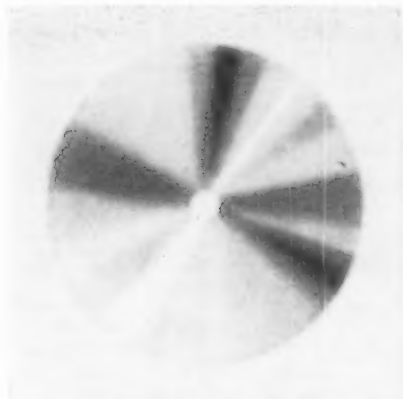
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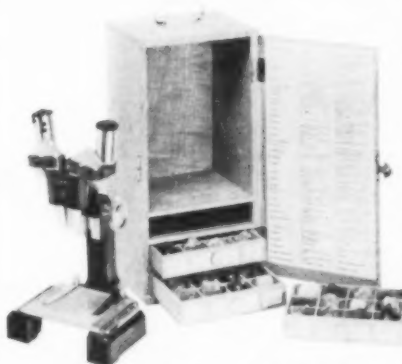
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